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A CONTRIBUTION TO THE FLORA OF BORI RESERVE FORESTS, HOSHANGABAD DISTRICT, MADHYA PRADESH

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ABSTRACT

The study of the flora of Bori Reserve Forests, Hoshangabad District, Madhya Pradesh has been undertaken during the years 1960 and 1961. The area stretches between 77°45′ to 78°30′ E. long. and 22°15′ to 22°30′ N. lat. on the southern slopes of Satpura range. As a result of three seasonal visits 432 taxa belonging to 317 genera of 92 families could be collected and studied. The flora presents a typical dry deciduous type of vegetation without any change in the main components throughout. Some of the common species of plants in this forest are *Anogeissus latifolia*, *Adina cordifolia*, *Aegle marmelos*, *Diospyros melanoxylon*, *Grewia tiliaefolia*, *Buchanania lanzan*, *Helicteres isora*, *Celastrus paniculata*, *Baliospermum montanum* and *Emblica officinalis*. The area under study lacks in hydrophytic vegetation as there is hardly any perennial natural water source. Similarly orchids and ferns are also rare.

INTRODUCTION

The present paper on the flora of Bori Reserve Forests is the outcome of an intensive study of plants of the forests of the Bori area, carried out by the author during the years 1960-61. The area of study is one of the botanically very little known regions, and it stretches between 77°45′ to 78°30′ E. long. and 22°15′ to 22°30′ N. lat. on the southern slopes of Satpura Range in the Hoshangabad District. As a result of three seasonal visits during the months, September to October, April to May and July, a total collection of 432 taxa has been made and studied. Much of the collection work and study of vegetation have been carried out in the forests around Bunglapura, Churna, Dhain and Bori proper, although some sporadic collection of plants has been made from around Hoshangabad town along the River Narmada and Pachmarhi plateau. All the specimens collected and studied have been deposited in the Regional Herbarium of Botanical Survey of India, Southern Circle, Coimbatore.

TOPOGRAPHY, SOIL AND CLIMATE

The altitude of the area under study ranges from 300 to 700 m., and in the Pachmarhi area altitude goes a little over 1000 m., from where only a scanty collection was made. There is hardly any perennial natural water source in the area, though there are many swiftly flowing temporary streams and rivulets traversing the forests at many places, besides ponds and puddles. The fairly big Towa river, near Bunglapura too gets dried up during dry months leaving few stagnant pools of water here and there along her course. A few hills like *SAKOTT* hill, *GOTTU DEO* hill which are the outspurs of Satpura ranges protrude into the area. The altitudes of them hardly go above 700 m. The undulating forest floor mainly consists of fertile black-cotton soil, mixed with sandy loam. However, in the hills, soil is chiefly composed of sand stones and shales and basaltic rocks. Soil erosion due to forest clearance has been markedly noticed around Bunglapura. The rain commences more or less in the middle of June, and the season protracts almost till the end of September. But it is during the months of July and August the area receives maximum record of rain, rendering the streams and rivers unpassable. The average rainfall of the area is 175 cm. The average maximum temperature is 40°C. and 8°C. is the average minimum in the winter.

GENERAL ASPECTS OF VEGETATION

The climax vegetation of Bori Reserve Forests is typically of a dry deciduous type. The reclamation of land has led to the vanishing of virgin forests from a large area around Bunglapura. On the contrary around Churna, Dhain and Bori, vast areas of undisturbed forests are met with. As for the main components of the vegetation, there is hardly any change throughout the forest. The dominant tree species of the forests are *Anogeissus latifolia*, *Tectona grandis*, *Terminalia* spp., *Adina cordifolia*, *Aegle marmelos*, *Mitragyna parvifolia*, *Manilkara hexandra*, *Ficus* spp., *Lagerstroemia parviflora*, *Chloroxylum swietenia*, *Buchanania lanzan*, *Soymida febrifuga*, *Cassia fistula*, *Pongamia pinnata*, *Dalbergia sissoo*, *Diospyros melanoxylon*, *Syzygium cumini* and *Grewia tiliaefolia*. The best teak forest-tracts are met with nearer to Bori. It is interesting to observe that *Madhuca indica* a common and abundant tree around Churna is not met with in the forests around Bori. The undergrowth vegetation includes characteristic shrubs of *Helicteres isora*, *Grewia hirsuta*, *G. rothii*, *Celastrus paniculata*, *Zizyphus* spp., *Moghania semialata*, *Mimosa himalayana*, *M. rubicaulis*, *Lawsonia inermis*, *Xeromphis spinosa*, *X. uliginosa*, *Carissa congesta*, *Petalidium barlerioides*, *Lantana camara* var. *aculeata*, *Baliospermum montanum*, *Securinega leucopyrus*, *Homonoia riparia* and *Boehmeria scabrella*. Near

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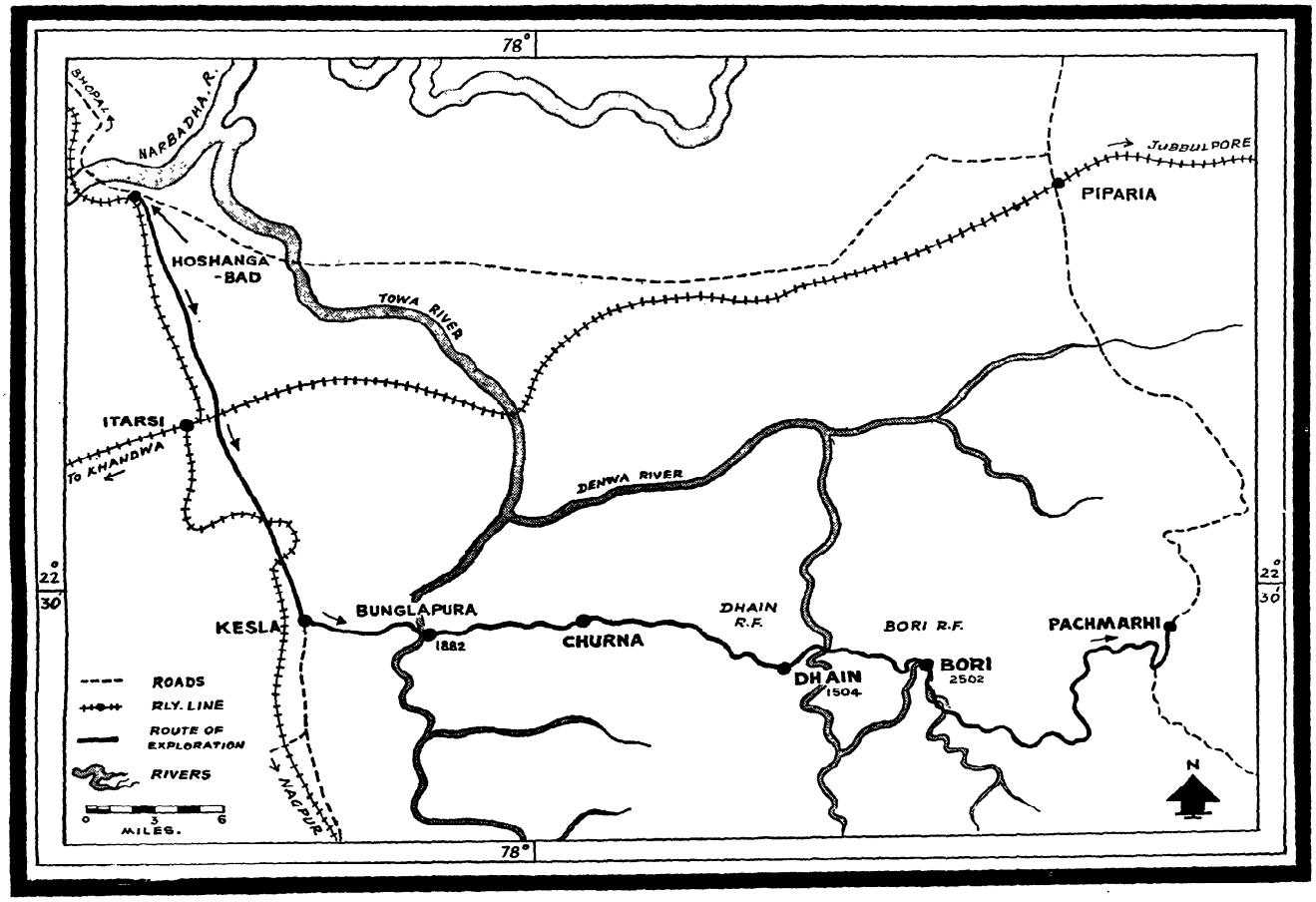
78°
BHOPAL
NARBADHA R.
JUBBULPORE
PIPARIA
HOSHANGA-BAD
TOWA RIVER
ITARSI
TO KHANDWA
DENWA RIVER
22° 30'
KESLA
BUNGLAPURA
1882
CHURNA
DHAIN R.F.
BORI R.F.
PACHMARHI
DHAIN
1504
BORI
2502
ROADS
RLY. LINE
ROUTE OF EXPLORATION
RIVERS
0 3 6
MILES.
NAGPUR
N
78°

Dhain and Bori there are vast forests of *Dendrocalamus strictus*. In general the ground cover is chiefly composed of different members of Gramineae, such as *Apluda mutica, Chloris dolichostachya, C. virgata, Dichanthium annulatum, Digitaria adscendens, Heteropogon contortus, Iseilema laxum, Manisuris forficulata, Melanocenchris jacquemontii, Panicum miliare, Pennisetum pedicellatum*, etc. as well as of Papilionaceae, such as *Alysicarpus hamosus, A. vaginalis, Crotolaria hirta, C. albida, C. linifolia, Desmodium diffusum, D. rotundifolium, Eleiotis sororia, Zornia diphylla, Teramnus labialis, Indigofera linnaei*, etc. Amidst the grasses in the open fields and also among the undershrubs the following herbaceous plants are commonly observed: *Cleome viscosa, Polygala chinensis, P. elongata, Polycarpon prostratum, Sida acuta, S. cordifolia, Urena lobata, Triumfetta rotundifolia, Mollugo pentaphylla, Borreria articularis, Acanthospermum hispidum, Eclipta prostrata, Elephantopus scaber, Tridax procumbens, Vernonia cinerea, Xanthium strumarium, Plumbago zeylanica, Canscora diffusa, Heliotropium scabrum, Trichodesma indicum, Leucas* spp., *Achyranthes aspera* var. *argentea, Aerva lanata, Allmania nodiflora* var. *dichotoma, Celosia argentea, Pupalia lappacea, Euphorbia hirta, E. parviflora, Costus speciosus* and *Curcuma amada*. Throughout the forests the undergrowth vegetation has been entangled by the numerous plants of climbing habit, such as *Ampelocissus latifolia, Cissampelos pareira, Passiflora foetida, Bryonopsis laciniosa, Momordica dioica, Clematis triloba, Lygodium flexuosum, Gymnema sylvestre, Hemidesmus indicus, Argyreia bracteata, A. involucrata, Ipomoea muricata, Dioscorea anguina, D. bulbifera, D. pentaphylla, Smilax zeylanica* and many members of the family Papilionaceae.

An interesting collection of five species of *Ophioglossum* could be made from the area, of which *Ophioglossum polyphyllum, O. costatum, O. gramineum* and *O. nudicaule* are found in abundance in the open moist ground especially around Churna. Besides numerous morphologically intermediate forms also could be picked up from among them. *Isoetes coromandelina* is met with in fair abundance in temporary ponds around Bunglapura. *Peristylus lawii*, a small terresterial, tuberous orchid with its ivory white small flowers is quite common in the sandy-loam soil of the forest floor around Churna.

Epiphytic orchids like *Vanda tessellata* and *Aerides odoratum* and parasites such as *Dendrophthoe falcata, Scurrula philippensis* and *Viscum nepalense* are quite common on deciduous trees throughout the forests. Temporary ponds, puddles and water edges harbour plants like *Ammannia baccifera, A. multiflora, jussiaea, suffruticosa, Caesulia axillaris, Rotula aquatica, Asteracantha longifolia, Cyperus* spp., *Eriocaulon, Sphaeranthus indicus* etc. As a whole 432 taxa of 92 families belonging to 314 genera have been collected and studied.

The following data are given for each species: locality, altitude, date of collection, field number and points of interest, if any. The classification of Bentham and Hooker is followed and the species under each family are arranged in an alphabetical order. Every attempt has been made to bring the nomenclature up-to-date. (Bor, 1960; Raizada, 1958; Santapau, 1960).

SYSTEMATIC ENUMERATION OF THE SPECIES COLLECTED AND STUDIED

SELAGINELLACEAE

Selaginella plumosa Baker

Towa river bank, 300 m., 30-9-1960, *Joseph* 11106. A fairly common terrestrial herb with greenish strobili.

ISOETACEAE

Isoetes coromandelina Linn. f.

Bunglapura, 356 m., 23-7-1961, *Joseph* 12849. Aquatic herb, in temporary ponds, with sporangia, not common.

EQUISETACEAE

Equisetum debile Roxb.

Churna, 413 m., 26-4-1961, *Joseph* 12425. Near streams, not fertile, rare.

OPHIOGLOSSACEAE

Ophioglossum costatum R. Br.

Bunglapura, 356 m., 22-7-1961, *Joseph* 12828. A small terrestrial fern, quite common and abundant in the open moist ground; leaves broad, oblong; fertile.

O. gramineum Willd.

Bunglapura, 500 m., 22-7-1961, *Joseph* 12838. Very common inconspicuous delicate herb in association with other allied species; leaves very narrow; fertile.

O. nudicaule Linn.

Bunglapura, 500 m., 22-7-1961, *Joseph* 12836. On moist situations along with other allied species, quite common and abundant; leaves small, ovate, well appressed over the ground; fertile.

O. polyphyllum A. Br. (=*O. capense* Sw.)

Bunglapura, 356 m., 28-7-1961, *Joseph* 12887. A terrestrial fern, very common and abundant in the open wet fields; leaves erect, elliptic-lanceolate; fertile.

O. reticulatum Linn.

Bunglapura, 356 m., 28-7-1961, *Joseph* 12887. A rare terrestrial fern, in shady places, with cordate membranous leaves; fertile.

SCHIZAEACEAE

Lygodium flexuosum (Linn.) Sw.

Bori area, 462 m., 4-10-1961, *Joseph* 11242. A

fairly common climbing fern with wiry stem; sporophyll with short sporangia all along the margin.

POLYPODIACEAE (*sensu lato*)

Adiantum philippense Linn. (=*A. lunulatum* Burm.)

Churna to Dhain, 430 m., 3-10-1960, *Joseph* 11221. A common lithophyte with chocolate brown caudex and crescent-shaped basal leaflets; sori in continuous lines along the margin.

Athyrium hohenackerianum Ktz.

Dhain to Bori, 462 m., 4-10-1960, *Joseph* 11247. Fairly common terrestrial herb up to 35 cm. tall; sori lunate or horse-shoe shaped. Not a conspicuous plant.

Cheilanthes farinosa (Forsk.) Kaulf.

Churna to Dhain, 430 m., 3-10-1960, *Joseph* 11221. "The Silver Fern", fairly common on road cuttings; lower surface of fronds covered with waxy powder with sori spreading along the margin. A very showy plant.

C. tenuifolia (Burm.) Sw.

Churna to Dhain, 430 m., 3-10-1960, *Joseph* 11204. Fairly common on road-cuttings and in the crevices of rocks. Fronds tripinnate, pinkish brown; sori separate at vein ends.

Leucostegia immersa (Wall.) Presl.

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11330. Fairly common lithophyte and epiphyte; rhizome creeping, stout with roots borne on all sides; sori large, impressed with very conspicuous indusia attached only by a narrow base. A graceful herb.

Tectaria macrodonta (Fee) C. Chr. (=*Aspidium cicutarium* Sw.)

Bori area, 1000 m., 6-10-1960, *Joseph* 11304. A fairly common terrestrial herb with large bipinnate showy fronds; sori on free veins more amply anastomosing; can be introduced in gardens.

PARKERIACEAE

Ceratopteris siliquosa (Linn.) Copel. (=*C. thalictroides* Brogn.)

Dhain to Bori, 462 m., 4-10-1960, *Joseph* 11248. Aquatic herb, common in ditches and shallow waters especially in sunny places; whole plant light green; sori along the veins.

RANUNCULACEAE

Clematis triloba Heyne

Bori R. F., 900 m., 6-10-1960, *Joseph* 11265. A fairly common climber on shrubs; flowers white, slightly scented.

ANNONACEAE

Annona squamosa Linn.

Kesla-Bunglapura, 356 m., 22-7-1961, *Joseph* 12823. A deciduous shrub with greenish yellow flowers; not common.

Miliusa tomentosa (Roxb.) Sinclair (=*Saccopetalum tomentosum* Hk. f. & Th.)

Bunglapura, 356 m., 4-5-1961, *Joseph* 12495. A fairly common large deciduous tree; inner whorl of petals chocholate brown; fruits aggregate.

M. velutina Hk. f. & Th.

Bunglapura, 356 m., 23-4-1961, *Joseph* 12399. A very common deciduous tree throughout the Bori Forest; inner whorl of petals greenish and deflexed over the pedicel.

MENISPERMACEAE

Cissampelos pareira Linn.

Dhain-Bori, 462 m., 4-10-1960, *Joseph* 11235. A fairly common climber; female flowers greenish yellow in pendulous racemes with large bracts; fruits brick-red.

CAPPARIDACEAE

Cleome viscosa Linn.

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11077. A very common herbaceous weed, in waste lands and in cultivated fields, with yellow flowers.

Maerua arenaria Hk. f. & Th.

Bunglapura, 356 m., 22-4-1961, *Joseph* 12396. A climbing shrub with white flowers and long stalked moniliform fruits; not common.

VIOLACEAE

Hybanthus enneaspermus (Linn.) F. v. Muell. (=*Ionidium suffruticosum* Ging.)

Bunglapura, 500 m., 22-7-1961, *Joseph* 12842. A common prostrate annual; flowers pinkish; capsule three valved with globose seeds.

FLACOURTIACEAE

Flacourtia indica (Burm. f.) Merr.

Bunglapura, 356 m., 23-4-1961, *Joseph* 12406. A common armed shrub with greenish globose fruits.

POLYGALACEAE

Polygala chinensis Linn.

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11080. An annual diffuse herb, quite common in open fields; flowers yellow, pendulous.

P. elongata Klein ex Willd.

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11314. A slender, erect, common herb, amidst grasses, with yellow flowers.

CARYOPHYLLACEAE

Polycarpon prostratum (Forsk.) Aschers. & Schweinf. [=*P. indicum* (Retz.) Merr.]

Bori R. F., 550 m., 28-4-1961, *Joseph* 12484. A common diffuse, pubescent herb with long thick tap root and greenish flower buds.

TAMARICACEAE

Tamarix ericoides Rottl.

Towa River bed, 300 m., 30-9-1960, *Joseph* 11094.

A common bushy shrub in the sandy river bed; stem brownish, brittle with scaly leaves; flowers rosy red in dense racemes.

ELATINACEAE

Bergia ammannioides Roxb.

Towa river bank, 300 m., 30-9-1960, *Joseph* 11118. Prostrate herb with pinkish flowers; fairly common.

MALVACEAE

Abelmoschus esculentus (Linn.) Moench. (=*Hibiscus esculentus* Linn.)

Towa river bank, 300 m., 28-9-1960, *Joseph* 11176. A tall, erect herb with yellow flowers; not common.

Hibiscus vitifolius Linn.

Churna, 430 m., 2-10-1960, *Joseph* 11201. A fairly common annual; flowers yellow with conspicuous purple spot at the throat.

Kydia calycina Roxb.

Towa river bank, 300 m., 30-9-1960, *Joseph* 11129. A common tree; flowers white in panicles.

Sida acuta Burm. (=*S. carpinifolia* Linn. f.)

Bunglapura, 300 m., 1-10-1960, *Joseph* 11143. A fairly common undershrub in open fields; flowers yellow.

S. cordifolia Linn.

Towa river bank, 300 m., 3-9-1960, *Joseph* 11117. A common herb with golden yellow flowers.

S. veronicaefolia Lamk.

Bori R. F., 550 m., 30-4-1961, *Joseph* 12475. A trailing herb, common in shady places; flowers yellow with long as well as short slender jointed pedicels.

Thespesia lampas (Cav.) Dalz. & Gibs. (=*Hibiscus lampas* Cav.)

Churna, 430 m., 2-10-1960, *Joseph* 11197. A fairly common. tall shrub with broad, three lobed leaves and yellow flowers.

Urena lobata Linn.

Towa river bank, 300 m., 30-9-1960, *Joseph* 11108. A common erect herb with palmately lobed leaves; flowers rosy-red; fruits with bristles.

BOMBACACEAE

Bombax ceiba L. [=*B. malabaricum* DC.; *Salmalia malabarica* (DC.) Schott. & Endl.]

Bunglapura 356 m., 22-7-1961, *Joseph* 12839. Cultivated tree.

STERCULIACEAE

Helicteres isora Linn.

Dhain, 462 m., 4-10-1960, *Joseph* 11223. A very common shrub; flowers reddish with dull yellow calyx, in short axillary cymes.

Waltheria indica Linn.

Bunglapura, 300 m., 1-10-1960, *Joseph* 11164. Common herb in grassy fields; flowers yellow, in dense axillary clusters.

TILIACEAE

Corchorus olitorius Linn.

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11084. A common herb with yellow flowers; capsules erect and ribbed.

C. trilocularis Linn.

Towa river bank, 300 m., 1-10-1960, *Joseph* 11187. A common herb, on river sides, with yellow flowers and narrow capsules.

Grewia hirsuta Vahl

Towa river bank, 300 m., 1-10-1960, *Joseph* 11177. Fruits distinctly lobed, fairly common.

G. rothii DC.

Bori area, 550 m., 28-4-1961, *Joseph* 12458. A common undershrub throughout the forest along the way sides, among grasses; flowers yellowish green or whitish.

G. tiliaefolia Vahl

Bunglapura, 356 m., 23-4-1961, *Joseph* 12400. A common tree; flowers yellowish in axillary pedunculate cymes.

Triumfetta pilosa Roth

Bori area, 500 m., 6-10-1960, *Joseph* 11252. A fairly common erect herb with yellow flowers.

T. rotundifolia Lamk.

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11079. Very common herb among grasses; flowers yellow.

LINACEAE

Linum mysorense Heyne

Bori-Pachmarhi, 900 m., 6-10-1960, *Joseph* 11259. A small erect annual herb, among grasses in open fields, with yellow flowers.

BALSAMINACEAE

Impatiens balsamina Linn.

Bori-Pachmarhi, 900 m., 6-10-1960, *Joseph* 11285. A very common annual herb with pinkish succulent stem; flowers rosy-red.

OXALIDACEAE

Biophytum sensitivum (L.) DC.

Bunglapura, 300 m., 30-9-1960, *Joseph* 11115. A small erect herb, common in shady places; flowers golden yellow.

RUTACEAE

Aegle marmelos Corr.

Bunglapura, 356 m., 24-4-1961, *Joseph* 12413. A common tree.

Murraya koenigii (Linn.) Spreng.

Churna, 413 m., 24-4-1961, *Joseph* 12422. Shrub with white flowers; not common.

MELIACEAE

Azadirachta indica A. Juss. (=*Melia azadirachta* Linn.)

Bunglapura, 356 m., 4-5-1961, *Joseph* 12500. A fairly common tree with white flowers.

Chloroxylum swietenia DC

Bunglapura, 356 m., 24-4-1961, *Joseph* 12414. A very common tall deciduous tree. Flowers white, scented.

Soymida febrifuga A. Juss.

Bunglapura, 356 m., 9-5-1961, *Joseph* 12501. A fairly common deciduous tree; capsules large, septicidal, with whitish winged seeds.

CELASTRACEAE

Celastrus paniculata Willd.

Bunglapura, 356 m., 22-4-1961, *Joseph* 12395. Common climbing shrub with creamy white flowers.

RHAMNACEAE

Ventilago calyculata Tul.

Churna, 413 m., 26-4-1961, *Joseph* 12429. A tall common climber with winged fruits.

Ziziphus mauritiana Lamk. (=*Z. jujuba* Lamk. non Mill.)

Towa river bank, 300 m., 30-4-1960, *Joseph* 11139. Flowers greenish-yellow, scented; very common.

Z. nummularia (Burm. f.) W. & A.

Bunglapura, 356 m., 23-4-1961, *Joseph* 12403. A fairly common, small tree with greenish yellow flowers.

Z. oenoplia Mill.

Bunglapura, 300 m., 1-10-1960, *Joseph* 11163. A common climbing shrub with spreading branches; flowers greenish-yellow.

Z. rugosa Lamk.

Bori R. F., 550 m., 30-4-1961, *Joseph* 12471. Flowers in long pedunculate cymes, creamy white; fruits pinkish-green; fairly common.

Z. xylopyra Willd.

Bunglapura, 356 m., 24-4-1961, *Joseph* 12420. Common shrub in open fields; flowers greenish-yellow, in congested cymes.

VITACEAE

Ampelocissus latifolia (Roxb.) Planch. (=*Vitis latifolia* Roxb.)

Bunglapura, 356 m., 22-7-1961, *Joseph* 12834. Common tendril climber with chocolate brown flowers.

Cayratia carnosa (Lamk.) Gagnep. (=*Vitis carnosa* Wall.)

Bori R. F., 500 m., 29-4-1961, *Joseph* 12454. Fairly common twining shrub, clothed with brownish hairs.

Leea edgeworthii Santapau (=*L. aspera* Edgew.)

Bunglapura, 500 m., 22-7-1961, *Joseph* 12840. Common undershrub; flower buds yellowish-green.

L. macrophylla Roxb.

Bunglapura, 600 m., 24-7-1961, *Joseph* 12869. Fairly common erect undershrub with large simple leaves; flower buds greenish-yellow.

SAPINDACEAE

Cardiospermum halicacabum Linn.

Towa river bank, 300 m., 1-10-1960, *Joseph* 11161. A common slender climber with light yellow flowers and winged capsules.

Schleichera oleosa (Lour.) Oken (=*S. trijuga* Willd.)

Bunglapura, 356 m., 23-4-1961, *Joseph* 12405. A fairly common tree with crustaceous indehiscent fruits.

ANACARDIACEAE

Buchanania lanzan Spreng. (=*B. latifolia* Roxb.)

Bunglapura, 356 m., 22-4-1961, *Joseph* 12398. A common tree; the kernels of the seeds are collected and eaten by the local people.

Lannea coromandelica (Houtt.) Merr. (=*Odina wodier* Roxb.)

Bunglapura, 356 m., 4-5-1961, *Joseph* 12493. A common deciduous tree; drupes pinkish-green, in bunches.

Rhus parviflora Roxb.

Bori R. F., 900 m., 6-10-1960, *Joseph* 11282. Fairly common tree with greenish-white flowers.

PAPILIONACEAE

Abrus precatorius Linn.

Towa river bank, 300 m., 1-10-1960, *Joseph* 11151. A fairly common twining shrub; seeds scarlet with a black spot, used for jeweller's weights.

Aeschynomene indica Linn.

Towa river bank, 300 m., 1-10-1960, *Joseph* 11167. A common slender erect herb with yellow flowers.

Alysicarpus hamosus Edgew.

Churna-Dhain, 430 m., 3-10-1960, *Joseph* 11207. A common hirsute herb with long trailing branches and yellow flowers.

A. vaginalis (Linn.) DC.

Bunglapura, 300 m., 30-9-1961, *Joseph* 11110. A common trailing herb amidst grasses; fruits faintly moniliform, massed at the ends of branches.

Atylosia scarabaeoides (L.) Benth.

Bunglapura, 300 m., 30-9-1960, *Joseph* 11130. A fairly common herbaceous climber with yellow flowers, and pods having thick coating of white-hairs.

Butea monosperma (Lamk.) Taub. (=*B. frondosa* Koenig ex Roxb.)

Bunglapura, 356 m., 23-4-1961, *Joseph* 12409. Common tree seen especially from Kesla to Bunglapura, with brick red showy flowers and flat broad pods.

Clitoria biflora Dalz.

Towa river bank, 300 m., 30-9-1960, *Joseph* 11140. A fairly common erect herb; flowers yellow; fruits deflexed.

Crotalaria albida Heyne ex Roth (=*C. epunctata* Dalz.)

Towa river bank, 300 m., 1-10-1960, *Joseph* 11152.

A common herb; flowers yellow, many on a long peduncle; fruits with persistent calyx lobes.

Crotalaria hirta Willd.
Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11039. A fairly common low herb amidst grasses in open fields; flowers yellow, in terminal short racemes.

C. juncea Linn.
Bunglapura, 300 m., 1-10-1060, *Joseph* 11145. Flowers yellow, in long racemes.

C. linifolia Linn. f.
Churna, 430 m., 2-10-1960, *Joseph* 11194. A common erect annual in open fields; flowers yellow; pods black.

C. orixensis Willd.
Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11059. A fairly common prostrate herb, among grasses, with yellow flowers.

C. trifoliastrum Willd.
Dhain, 462 m., 4-10-1960, *Joseph* 11238. Erect herb, fairly common in the open fields, with yellow flowers and small globular pods.

C. triquetra Dalz.
Dhain-Bori, 462 m., 4-10-1960, *Joseph* 11231. Common, slender undershrubs with pale yellow flowers.

Dalbergia sissoo Roxb.
Bunglapura, 356 m., 4-5-1961, *Joseph* 12496. A common tree; flowers yellow in short panicles; fruits flat and thin.

Desmodium diffusum DC.
Bunglapura, 300 m., 1-10-1960, *Joseph* 11179. Common; flowers pinkish in long racemes; tomentum narrow and thin.

D. gangeticum (Linn.) DC.
Bunglapura, 300 m., 1-10-1960, *Joseph* 11144. A common herb among grasses, with pinkish flowers and deep brown purple pods.

D. motorium (Houtt.) Merr. [=*D. gyrans* (Linn. f.) DC.]
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11329. Not common; flowers bluish-white. The Semaphore plant.

D. polycarpum (Poir.) DC.
Churna, 430 m., 3-10-1960, *Joseph* 11210. A tall herb, fairly common; flowers small, violet; fruits much crowded.

D. rotundifolium Baker non Wall.
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11315. A common prostrate herb; flowers deep pink, external surface of the standard petal is whitish.

Dolichos biflorus Linn.
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11316. Fairly common; flowers greenish-yellow; pods flat, somewhat falcate.

Eleiotis sororia DC.
Bunglapura, 300 m., 30-9-1960, *Joseph* 11138. A slender trailing herb, common; leaves 3-foliolate with a large terminal leaflet and 2 very small side ones; flowers rosy-red.

Indigofera glandulosa Roxb. ex Willd.
Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11040. Common; flowers pinkish in axillary short racemes.

I. hirsuta Linn.
Towa river bank, 300 m., 1-10-1960, *Joseph* 11166. Common; flowers pinkish, in dense racemes; fruits densely hirsute.

I. linifolia Retz.
Bunglapura, 300 m., 30-9-1960, *Joseph* 11120. Common; flowers deep red; fruits globular.

I. linifolia Retz. var. **campbellii** Wt.
Dhain, 430 m., 28-7-1961, *Joseph* 12880. Common procumbent herb with pink flowers.

I. linnaei Ali (=*I. enneaphylla* Linn.)
Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11073. A very common prostrate herb, among grasses, with pinkish white flowers.

I. pulchella Roxb.
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11309. Common undershrub with pinkish flowers and straight shortly beaked pods.

Millettia auriculata Baker
Churna, 413 m., 27-7-1961, *Joseph* 12873. A large common woody climber; flowers whitish, in long racemes.

Moghania semialata (Roxb.) Mukerjee (=*Flemingia semialata* Roxb.)
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11318. A common undershrub; flowers bluish; fruits in congested clusters.

Phaseolus dalzellii Cooke (=*P. pauciflorus* Dalz.)
Dhain-Bori, 462 m., 4-10-1960, *Joseph* 11234. A fairly common slender climbing herb with yellowish-white flowers and narrow fruits.

P. sublobatus Roxb. (=*P. trinervius* Heyne)
Dhain-Bori, 462 m., 4-10-1160, *Joseph* 11229. A fairly common herb, amidst wayside grasses, with yellow flowers.

Pongamia pinnata (Linn.) Pierre (=*P. glabra* Vent.)
Bori R. F., 550 m., 28-4-1961, *Joseph* 12434. A fairly common tree with slightly scented white flowers and obliquely elliptic pods.

Rhynchosia minima DC.
Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11068. Common in open fields; flowers pinkish.

Sesbania cannabina (Retz.) Pers.
Bunglapura, 300 m., 1-10-1960, *Joseph* 11150. A fairly common tall erect herb amidst grasses; flowers yellow.

Smithia blanda var. **racemosa** Bak. (=*S. hirsuta* Dalz.)
Bori R. F., 900 m., 6-10-1960, *Joseph* 11277. Fairly common prostrate herb, amidst grasses, with yellow flowers.

S. conferta Sm. (=*S. geminiflora* Roth var. *conferta* Bak.)
Bunglapura-Churna, 430 m., 2-10-1960, *Joseph* 11192. A common prostrate herb with pinkish flowers.

Sophora interrupta Bedd.
Bori R. F., 900 m., 6-10-1960, *Joseph* 11274. A fairly common small tree with yellow flowers.

Tephrosia purpurea (Linn.) Pers.
Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11065. Common; flowers deep pink.

Teramnus labialis (Linn. f.) Spreng.
Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11093. A fairly common slender twining herb with yellow flowers; pods stout, recurved.

T. mollis Benth. (=*T labialis* Spreng. var. *mollis* Bak.)
Kesla-Bunglapura, 356 m., 22-7-1961, *Joseph* 12833. Common slender twining herb with pink flowers.

Uraria picta Desv.
Churna-Dhain, 436 m., 3-10-1960, *Joseph* 11218. An undershrub amidst grasses, not very common; leaves with light green patches along the midrib; flowers pinkish with blue tinge, in long terminal congested racemes; fruits small, black.

Zornia diphylla (Linn.) Pers.
Churna-Dhain, 430 m., 3-10-1960, *Joseph* 11206. Common; flowers yellow.

CAESALPINIACEAE

Bauhinia racemosa Lamk.
Bunglapura, 356 m., 23-4-1961, *Joseph* 12410. A common tree.

B. vahlii W. & A.
Bori R. F., 550 m., 29-4-1961, *Joseph* 12442. A large liane with white flowers; not common.

Cassia fistula Linn.
Bori R. F., 550 m., 30-4-1961, *Joseph* 12470. A very common tree with long pendulous inflorescence of golden yellow flowers.

C. occidentalis Linn.
Churna-Dhain, 430 m., 3-10-1960, *Joseph* 11217. A very common undershrub, in open fields, with yellow flowers and flat pods.

C. pumila Lamk.
Bunglapura, 300 m., 30-9-1960, *Joseph* 11102. A fairly common prostrate herb, leaves with sleeping movement; flowers yellow.

C. tora Linn.
Around Hoshangabad, 300 m., 28-9-1960, *Joseph* 11076. Very common in waste lands with yellow flowers and long curved pods.

Piliostigma malabaricum (Roxb.) Benth.
Churna-Dhain, 430 m., 3-10-1960, *Joseph* 11213 A fairly common tree with pinkish flowers.

MIMOSACEAE

Acacia leucophlaea (Roxb.) Willd.
Kesla-Bunglapura, 356 m., 23-7-1961, *Joseph* 12831. Common tree with stipular spines; flower buds greenish yellow.

Albizzia odoratissima (Linn. f.) Benth.
Churna, 413 m., 26-4-1961, *Joseph* 12426. Common; flowers with greenish petals and white filaments.

Mimosa himalayana Gamble
Dhain, 430 m., 28-7-1961, *Joseph* 12879. A fairly common prickly shrub with rosy-red spikes.

M. rubicaulis Lamk.
Bunglapura, 300 m., 30-9-1960, *Joseph* 11135. A fairly common straggling very prickly shrub, near stream sides, with rosy-red spikes.

COMBRETACEAE

Anogeissus latifolia (DC.) Wall. ex Bedd.
Bunglapura, 356 m., 30-9-1960, *Joseph* 11122. Very common, deciduous tree with flowers in small dense heads.

Combretum ovalifolium Roxb.
Bunglapura, 356 m., 22-4-1961, *Joseph* 12389. A common climbing shrub with greenish-yellow winged fruits in bunches.

Terminalia bellirica (Gaertn.) Roxb.
Bunglapura 356 m., 24-4-1961, *Joseph* 12418. A very common deciduous tree with greenish-yellow or dull pink, strongly scented flowers.

T. chebula Retz.
Bunglapura, 356 m., 23-4-1961, *Joseph* 11332, and around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 12411. Flowers yellow, scented; fruits more or less 5-angled when ripe.

T. tomentosa Wt. & Arn.
Bunglapura, 600 m., 24-7-1961, *Joseph* 11323. Flowers slightly scented, yellow. Pachmarhi, 1000 m., 8-10-1960, *Joseph* 12858. Fruits large, winged.

MYRTACEAE

Syzygium cumini (Linn.) Skeels (=*S. jambolanum* DC.; *Eugenia jambolana* Lamk.)
Churna, 413 m., 26-4-1961, *Joseph* 12424. Common tree with white flowers.

S. heyneanum Wall.
Bunglapura, 356 m., 22-4-1961, *Joseph* 12385. A fairly common tree with slightly scented white flowers.

LYTHRACEAE

Ammannia baccifera Linn.
Towa river bank, 300 m., 30-9-1960, *Joseph* 11116.

A common herb, on moist soil, with pinkish stem and reddish flowers.

Ammannia baccifera Linn. var. **aegyptiaca** Koeh.

Towa river bank, 356 m., 22-4-1961, *Joseph* 12387. A common prostrate herb, along the river bed, with long tap-root and pinkish flowers.

A. multiflora Roxb.

Towa river bank, 300 m., 30-9-1960, *Joseph* 11099. A common small erect herb, in moist soil around ponds and river beds, with pinkish flowers.

Lagerstroemia parviflora Roxb.

Bunglapura, 356 m., 23-4-1961, *Joseph* 12402. A common deciduous tree with white flowers in panicles; the last season's capsules are also present.

Lawsonia inermis Linn. (=*L. alba* Lamk.)

Bunglapura, 356 m., 23-4-1961, *Joseph* 12402. A common hedge plant with slightly scented greenish-white flowers and globose capsules.

ONAGRACEAE

Jussiaea suffruticosa Linn.

Towa river bank, 300 m., 30-9-1960, *Joseph*, 11133. Fairly common herb, in wet soil with yellow flowers and sub-quadrangular capsules.

SAMYDACEAE

Casearia graveolens Dalz.

Bori R. F., 550 m., 29-4-1961, *Joseph* 12446. A fairly common shrub; flowers greenish in small axillary clusters on mature stem; young fruits with persistent sepals.

PASSIFLORACEAE

Passiflora foetida Linn.

Towa river bank, 300 m., 1-10-1960, *Joseph* 11163. A very common climber; fruits with persistent much dissected epicalyx.

CUCURBITACEAE

Bryonopsis laciniosa (Linn.) Naud. (=*Bryonia laciniosa* Linn.)

Hoshangabad, 300 m., 28-9-1960, *Joseph* 11090. A fairly common slender climbing herb; flowers yellow; fruits globular, green with white stripes.

Cucumis melo Linn. var. **cultus** Ktz.

Dhain, 430 m., 28-7-1961, *Joseph* 12884. Not common; flowers yellow.

C. melo Linn. var. **agrestis** Naud. (=*C. pubescens* Willd.)

Bunglapura, 356 m., 4-5-1961, *Joseph* 12499. Fairly common; flowers yellow.

Melothria maderaspatana (Linn.) Cogn. (=*Mukia scabrella* Arn.)

Hoshangabad, 300 m., 28-9-1960, *Joseph* 11092. A fairly common, scabrous herb with yellow flowers.

Momordica dioica Roxb. ex Willd.

Kesla-Bunglapura, 356 m., 22-7-1961, *Joseph* 12832. Common; flowers yellow; fruits muricate.

Trichosanthes cucumerina Linn.

Hoshangabad, 300 m., 28-9-1960, *Joseph* 11087. A common slender climber, with bad smelling laciniate white flowers; fruits green and striped.

T. bracteata (Lamk.) Voigt (=*T. palmata* Roxb.)

Bori R. F., 550 m., 30-4-1961, *Joseph* 12478. Not very common.

BEGONIACEAE

Begonia picta Sm.

Bori R. F., 900 m., 6-10-1960, *Joseph* 11263. A fairly common, succulent herb with winged fruits.

MOLLUGINACEAE

Glinus lotoides Linn. (=*Mollugo lotoides* Ktz.; *M. hirta* Thunb.)

Bori R. F., 550 m., 30-4-1961, *Joseph* 12468. Fairly common prostrate herb with stellate hairs; flowers yellow.

Mollugo pentaphylla Linn. (=*M. stricta* Linn.)

Towa river bank, 300 m., 30-9-1960, *Joseph* 11096. A slender common herb; flowers light yellow in polychasial cymes.

UMBELLIFERAE

Bupleurum plantaginifolium Wt.

Bori R. F., 900 m., 6-10-1960, *Joseph* 11260. Fairly common erect herb; flowers small, yellow, in compound umbels.

Pimpinella heyneana Wall. ex Kurz

Dhain, 462 m., 4-10-1960, *Joseph* 11230. Fairly common herb; flowers white, in umbels.

P. monoica Dalz.

Bori R. F., 900 m., 6-10-1960, *Joseph* 11268. A fairly common tall herb, in shady places, with white flowers.

RUBIACEAE

Adina cordifolia (Roxb.) Hook. f. ex Brandis

Bunglapura, 356 m., 4-5-1961, *Joseph* 12490. A very common deciduous tree; fruit a cluster of capsules.

Anotis calycina Hk. f.

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11321. Quite common and abundant herb with white flowers.

Borreria articularis (Linn. f.) F. N. Will. [=*B. hispida* (Linn.) Schum.]

Hoshangabad, 300 m., 28-9-1960, *Joseph* 11131. A common hispid procumbent herb in cultivated fields; flowers with white corolla and mauve petals.

B. stricta (Linn. f.) Schum. (=*Spermacoce stricta* Linn. f.)

Hoshangabad, 300 m., 28-9-1960, *Joseph* 11061. Very common; flowers with white deciduous corolla.

Gardenia latifolia Ait.

Kesla-Bunglapura. 500 m., 23-7-1961, *Joseph* 12853. Fairly common small tree; young fruits ellipsoid.

G. turgida Roxb.

Bunglapura, 356 m., 24-4-1961, *Joseph* 12419.

Fairly common small tree with strong spines; flowers white, fragrant.

Mitragyna parvifolia (Roxb.) Korth. (=*Stephegyne parvifolia* Korth.)

Churna, 413 m., 26-4-1961, *Joseph* 12427. Very common deciduous tree with creamy white flowers in pedunculate heads.

Oldenlandia herbacea (Linn.) Roxb.

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11313. A fairly common bushy herb; flowers white.

Spermadictyon suaveolens Roxb. (=*Hamiltonia suaveolens* Roxb.)

Bori R. F., 550 m., 6-10-1960, *Joseph* 11275. Fairly common undershrub; flowers pinkish.

Wendlandia heynei (R. & S.) Sant. & Merch. [=*W. exserta* (Roxb.) DC.]

Bori R. F., 550 m. 29-4-1961, *Joseph* 12441. Common; flowers dull white, in panicles.

Xeromphis spinosa (Thunb.) Keay [=*Randia spinosa* (Thunb.) Bl.]

Bunglapura, 356 m., 4-5-1961, *Joseph* 12491. A fairly common shrub with axillary spines and white flowers.

X. uliginosa (Retz.) Mahesh. (=*Randia uliginosa* DC.)

Churna, 413 m., 27-7-1961, *Joseph* 12877. Common, small tree; flowers ivory-white, solitary.

COMPOSITAE

Acanthospermum hispidum DC.

Bunglapura, 300 m., 30-9-1960, *Joseph* 11136. A common weed, in waste land, with yellow flowers.

Ageratum conyzoides Linn.

Dhain, 462 m., 4-10-1960, *Joseph* 11241. Common weed.

Bidens biternata (Lour.) Merr. & Sherff (=*B. pilosa* auct. non Linn.)

Bori R. F., 900 m. 6-10-1960, *Joseph* 11258. Common; flowers white.

Blainvillea acmella (Linn. f.) Philipson (=*B. rhomboidea* Cass.; *B. latifolia* DC.)

Bunglapura, 300 m., 1-10-1960, *Joseph* 11181. Fairly common scabrous herb with yellowish heads.

Blumea membranacea DC. var. **gracilis** Hk. f.

Bori R. F., 550 m., 30-4-1961, *Joseph* 12480. Common; flowers in panicles of heads.

B. obliqua (Linn.) Druce (=*B. amplectens* DC.)

Bunglapura, 356 m., 22-4-1961, *Joseph* 12390. Common; flowers yellow.

Caesulia axillaris Roxb.

Towa river bank, 300 m., 30-9-1960, *Joseph* 11097. Common on wet soil; florets axillary, whitish.

Centratherum anthelminticum (Willd.) Ktz. (=*Vernonia anthelminticum* Willd.)

Bori R. F., 900 m., 6-10-1960, *Joseph* 11267. Common in the cultivated fields; flowers purple.

C. indicum (Less.) C.E.C. Fischer [=*C. reticulatum* (DC.) Benth.]

Dhain, 462 m., 4-10-1960, *Joseph* 11225. A common handsome herb with beautiful violet heads.

Eclipta prostrata (Linn.) Linn. [=*E. alba* (Linn.) Hassk.]

Bunglapura, 356 m., 4-5-1961, *Joseph* 12487. Common; flower heads white.

Elephantopus scaber Linn.

Churna, 430 m., 2-10-1960, *Joseph* 11190. Common, among grasses, with pinkish flower heads.

Emilia sonchifolia (Linn.) DC.

Dhain, 462 m., 4-10-1960, *Joseph* 11244. A common procumbent herb with purple flowers.

Guizotia abyssinica (Linn.) Cass.

Bori R. F., 900 m., 6-10-1960, *Joseph* 11272. Cultivated for oil extraction from seeds.

Lagascea mollis Cav.

Bunglapura, 300 m., 1-10-1960, *Joseph* 11142. Common pubescent herb with white flower heads.

Launaea nudicaulis Hk. f.

Bunglapura, 356 m., 4-5-1961, *Joseph* 12486. Common; flowers whitish-yellow.

Pulicaria wightiana (DC.) Benth. ex C.B. Cl.

Bori R. F., 900 m., 6-10-1960, *Joseph* 11255. Common herb with yellow flowers.

Sclerocarpus africanus Jacq.

Bunglapura, 300 m., 1-10-1960, *Joseph* 11168. Common tall herb with golden yellow flowers.

Senecio grahamii Hk. f.

Bori R. F., 900 m., 6-10-1960, *Joseph* 11266. A common slender herb with pinkish stem and yellow flowers.

Sphaeranthus indicus Linn.

Bori R. F., 550 m., 30-4-1961, *Joseph* 12465. A common prostrate herb in wet places; heads pinkish violet.

Tridax procumbens Linn.

Hoshangabad, 300 m., 28-9-1960, *Joseph* 11049. Common amidst grasses; flowers white.

Vernonia cinerea (Linn.) Less.

Dhain, 462 m., 4-10-1960, *Joseph* 11239. Quite common weed; flowers purple.

Vicoa indica (Willd.) DC. (=*V. auriculata* Cass.)

Bori R. F., 550 m., 30-4-1961, *Joseph* 12461. Common; flowers bright yellow.

Volutarella ramosa (Roxb.) Santapau (=*V. divaricata* Benth.)

Bunglapura, 356 m., 4-5-1961, *Joseph* 12485. Fairly common straggling herb, with spinous bracts.

Xanthium strumarium Linn.

Round about Hoshangabad, 300 m., 28-9-1960,

Joseph 11078. Quite common in waste land; heads greenish white.

CAMPANULACEAE

Wahlenbergia marginata (Thunb.) A. DC. (*W. gracilis* Schrad. ex DC.)

Bori R. F., 550 m., 28-4-1961, *Joseph* 12430. A common erect herb near river side; flower whitish.

PLUMBAGINACEAE

Plumbago zeylanica Linn.

Bori R. F., 900 m., 6-10-1960, *Joseph* 11261. Quite common in moist localities; flowers white with conspicuously glandular persistent calyx.

MYRSINACEAE

Embelia tsjeriam-cottam A. DC. (=*E. robusta* Clarke non Roxb.)

Churna, 413 m., 27-7-1961, *Joseph* 12874. A fairly common shrub; flowers greenish-white, slightly scented, in axillary racemes.

SAPOTACEAE

Madhuca indica J.F. Gmel. (=*Bassia latifolia* Roxb.)

Bunglapura, 356 m., 24-4-1961, *Joseph* 12407. Quite common around Churna; a very large deciduous tree with creamy white flowers; corolla fleshy, edible.

Manilkara hexandra (Roxb.) Dub. (=*Mimusops hexandra* Roxb.)

Bori R. F., 550 m., 30-4-1961, *Joseph* 12456. Flowers creamy white, scented. Bunglapura, 600 m., 24-7-1961, *Joseph* 12861. Berries ellipsoid.

Mimusops elengi Linn.

Kesla, 356 m., 22-7-1961, *Joseph* 12819. Few; flowers creamy white.

EBENACEAE

Diospyros melanoxylon Roxb.

Bunglapura, 356 m., 23-4-1961, *Joseph* 12408. Quite common; inflorescence tawny tomentose; flowers creamy white.

OLEACEAE

Jasminum roxburghianum Wall.

Bunglapura, 356 m., 24-4-1961, *Joseph* 12416. A fairly common villous climbing shrub with young ellipsoid fruits.

Schrebera swietenioides Roxb.

Kesla-Bunglapura, 500 m., *Joseph* 12835. A moderate sized tree with yellow flowers covered with short brownish hairs.

APOCYNACEAE

Carissa congesta Wt.

Bori R. F., 550 m., 1-5-1961, *Joseph* 12481. A common thorny shrub with sweet scented white flowers.

Holarrhena antidysenterica (Linn.) Wall.

Bunglapura, 356 m., 24-4-1961, *Joseph* 12397. Common with white, slightly scented flowers.

Ichnocarpus frutescens (Linn.) R. Br.

Bunglapura, 300 m., 30-9-1960, *Joseph* 11128. A fairly common climbing shrub with whitish flowers.

Vallaris solanacea (Roth) Ktz. (=*V. heynei* Spreng.)

Bori R. F., 550 m., 28-4-1961, *Joseph* 12433. Fairly common twiner with white flowers.

Wrightia tinctoria R. Br.

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11306. Fairly common tree with narrow follicles cohering at the tips.

ASCLEPIADACEAE

Ceropegia hirsuta Wt. & Arn.

Bori R. F., 550 m., 6-10-1960, *Joseph* 11284. A slender hispid climber; few; corolla whitish with pinkish brown patches.

Cryptolepis buchanani R. & S.

Bori R. F., 550 m., 30-4-1961, *Joseph* 12459. A common shrubby climber; leaves whitish beneath; flowers yellowish green.

Gymnema sylvestre (Linn.) Schultes

Kesla, 356 m., 22-7-1961, *Joseph* 12821. Fairly common climber; flowers yellowish.

Hemidesmus indicus (Linn.) Schultes

Bunglapura, 300 m., 30-9-1960, *Joseph* 11134. Common wiry twining shrub with yellow flowers.

Holostemma annulare (Roxb.) Schum. (=*H. rheedei* Wall.)

Bunglapura, 600 m., 24-7-1961, *Joseph* 12864. Fairly common; flowers with white outer surface and chocolate brown inner.

Leptadenia reticulata Wt. & Arn.

Kesla, 550 m., 22-7-1961, *Joseph* 12844. Fairly common; flowers yellow.

Telosma pallida (W. & A.) Craib

Kesla, 356 m., 22-7-1961, *Joseph* 12829. Common; flowers greenish yellow.

LOGANIACEAE

Cynoctonum mitreola (Linn.) Britton (=*Mitreola oldenlandioides* Wall. ex A. DC.)

Dhain, 462 m., 4-10-1960, *Joseph* 11245. A common slender herb; flowers white, fruits laterally compressed.

GENTIANACEAE

Canscora diffusa R. Br.

Churna, 430 m., 2-10-1960, *Joseph* 11193. A common slender, dichotomously branching herb with pinkish flowers.

Enicostemma hyssopifolium (Willd.) Verdoorn (=*E. littorale* Blume; *E. verticillatum* Engl.)

Hoshangabad, 300 m., 28-9-1960, *Joseph* 11048. Fairly common; flowers white.

Exacum bicolor Roxb.

Churna, 430 m., 2-10-1960, *Joseph* 11191. A fairly common erect herb; corolla white in the lower half, blue in the upper.

Exacum petiolare Griseb.
Bori R. F., 900 m., 6-10-1960, *Joseph* 11270. A common herb; flowers creamy white with winged ovary.

BORAGINACEAE

Cynoglossum meeboldii Brand (=*C. denticulatum* A. DC. var. *zeylanicum* C.B. Cl.)
Dhain, 462 m., 4-10-1960, *Joseph* 11232. Common; flowers white with blue tinge, in long slender racemes.

Heliotropium scabrum Retz.
Dhain, 430 m., 28-7-1961, *Joseph* 12882. A common hispid herb; flowers white in long unilateral spikes.

Trichodesma indicum (Linn.) R. Br.
Bunglapura, 300 m., 1-10-1960, *Joseph* 11188. A fairly common erect hispid herb, on dry waste lands, with bluish-violet flowers.

EHRETIACEAE

Cordia dichotoma Forst. f. (=*C. obliqua* Willd.)
Bori R. F., 550 m., 29-4-1961, *Joseph* 12443. A fairly common deciduous tree; fruits ovoid with persistent calyx.

Ehretia laevis Roxb.
Bori R. F., 550 m., 29-4-1961, *Joseph* 12449. Fairly common; flowers greenish white.

Rotula aquatica Lour. (=*Rhabdia lycioides* Mart.)
Bori R. F., 500 m., 6-10-1960, *Joseph* 11251. A small common erect shrub in the crevices of rocks in river and along river-sides; flowers pinkish.

CONVOLVULACEAE

Argyreia bracteata Choisy
Bunglapura, 300 m., 1-10-1960, *Joseph* 11157. A common climbing shrub with deep pink flowers.

A. involucrata C. B. Cl.
Bori R. F., 1000 m., 6-10-1960, *Joseph* 11296. Common; corolla pinkish outside and whitish inside.

Evolvulus alsinoides (Linn.) Linn.
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11070 A common prostrate herb, in open grounds, with bluish flowers.

Ipomoea angulata Lamk. (=*Quamoclit phoenicea* Choisy)
Dhain, 462 m., 4-10-1960, *Joseph* 11227. A slender twiner with blood red flowers; rare.

I. eriocarpa R. Br. [=*I. hispida*, (Vahl) R. & S.]
Bunglapura, 300 m., 1-10-1960, *Joseph* 11174. A slender villous climber with rosy red flowers.

I. muricata (Linn.) Jacq. (=*Calonyction muricatum* G. Don)
Bunglapura, 300 m., 1-10-1960, *Joseph* 11153. Common; flowers blue.

I. pes-tigridis Linn.
Bunglapura, 300 m., 30-9-1960, *Joseph* 11141. A fairly common slender hairy climber with white flowers.

Jacquemontia paniculata (Burm.) Hall. f.
Bunglapura, 300 m., 1-10-1960, *Joseph* 11169. Common; flowers rosy-red in compound umbels.

CUSCUTACEAE

Cuscuta reflexa Roxb.
Bori R. F., 1000 m., 6-10-1960, *Joseph* 11291. An intertwining leafless stem parasite; few.

SOLANACEAE

Capsicum frutescens Linn.
Bunglapura, 300 m., 1-10-1960, *Joseph* 11159. Not common; flowers white.

Datura metel Linn. (=*D. fastuosa* Linn.)
Bunglapura, 356 m., 23-4-1961, *Joseph* 12401. A very common weed with conspicuous large white flowers.

Nicandra physaloides (Linn.) Gaertn.
Bunglapura 300 m., 1-10-1960, *Joseph* 11158. Not common, flowers bluish.

Nicotiana plumbaginifolia Viv.
Towa river bank, 356 m., 22-4-1961, *Joseph* 12393. Not very common; a small annual herb; flowers rosy-red.

Physalis minima Linn.
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11086. Very common herbaceous weed in waste lands; flowers yellow.

Solanum surattense Burm. f. (=*S. xanthocarpum* Schrad. & Wendl.)
Bunglapura, 356 m., 22-4-1961, *Joseph* 12391. A common thorny undershrub with violet flowers.

S. torvum Sw.
Bori R. F., 900 m., 6-10-1960, *Joseph* 11283. Very common; flowers violet.

SCROPHULARIACEAE

Alectra thomsonii Hk. f.
Bunglapura, 300 m., 30-9-1961, *Joseph* 11137. A fairly common root parasite, often met with in shady places, with scale leaves and yellow flowers.

Buchnera hispida Buch.-Ham.
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11327. A common hispid annual herb with bluish-pink flowers.

Limnophila indica (Linn.) Druce (=*L. gratioloides* R. Br.)
Churna, 430 m., 3-10-1960, *Joseph* 11211. A common hydrophyte; flowers white.

Lindenbergia indica (Linn.) Ktz. (=*L. polyantha* Royle ex Benth.; *L. urticaefolia* Linn.)
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11324. A common annual herb with yellow flowers.

Scoparia dulcis Linn.
Bori R. F., 900 m., 6-10-1960, *Joseph* 11257. Common weed.

Sopubia delphinifolia (Roxb.) G. Don
Bunglapura, 300 m., 30-9-1960, *Joseph* 11132. Common among grasses; leaves filiform; flowers pinkish.

Striga asiatica (Linn.) Ktz. (=*S. lutea* Lour.)
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11066. A common erect scabrous small parasitic herb in grassy fields.

Verbascum chinense Santapau (=*Celsia coromandeliana* Vahl)
Bori R. F., 550 m., 30-4-1961, *Joseph* 12469. Common weed; flowers yellow; capsules septicidal, globose.

GESNERIACEAE

Didymocarpus pygmaea C.B. Cl.
Bori area, 1000 m., 6-10-1960, *Joseph* 11300. A fairly common lithophyte with a single broad leaf; capsules linear.

BIGNONIACEAE

Dolichandrone falcata Seem. var. **lawii** (Seem.) Haines
Bori R. F., 550 m., 29-4-1961, *Joseph* 12450. A common small deciduous tree with white; scented flowers.

Radermachera xylocarpa (Roxb.) Schum.
Bori R. F., 550 m., 30-4-1961, *Joseph* 12473. A large deciduous tree; fairly common; flowers yellow in panicles.

MARTYNIACEAE

Martynia annua Linn. (=*M. diandra* Glox.)
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11095. Fairly common herb; flowers with rosy-red corolla having deep pink lobes.

PEDALIACEAE

Sesamum orientale Linn. (=*S. indicum* Linn.)
Churna, 430 m., 3-10-1960, *Joseph* 11220. Fairly common.

ACANTHACEAE

Andrographis echioides (Linn.) Nees
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11045. A common villous weed; flowers yellowish white, in unilateral raceme.

Barleria cristata Linn.
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11339. A fairly common hirsute herb with bluish-pink flowers.

B. gibsoni Dalz.
Bunglapura, 300 m., 1-10-1960, *Joseph* 11165. A common unarmed undershrub; flowers white.

Blepharis molluginifolia Pers.
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11060. A common prostrate villous herb with blue flowers.

Dipteracanthus cernua (Roxb.) Santapau
Kesla-Bunglapura, 500 m., 23-7-1961, *Joseph* 12852. A common hirsute herb with creamy white flowers.

Eranthemum purpurascens Nees
Dhain, 462 m., 4-10-1960, *Joseph* 11228. Fairly common; flowers blue.

Hemigraphis latebrosa Nees var. **heyneana** Brem.
Churna, 430 m., 3-10-1960, *Joseph* 11205. A fairly common pubescent herb with blue flowers.

Hygrophila auriculata (Schum.) Heine [=*Asteracantha longifolia* (Linn.) Nees]
Bori area, 1000 m., 6-10-1960, *Joseph* 11299. Quite common, near water sources, with long sharp spines at the nodes; flowers bluish.

H. serpyllum (Nees) T. And.
Bori R. F., 550 m., 28-4-1961, *Joseph* 12431. A common herb, in wet places, with bluish flowers.

Justicia betonica Linn.
Dhain, 462 m., 4-10-1960, *Joseph* 11224. Common in waste lands; flowers white.

Justicia simplex D. Don
Churna, 430 m., 4-10-1960, *Joseph* 11203. A slender herb; common; flowers pinkish.

Lepidagathis cristata Willd.
Dhain, 462 m., 4-10-1960, *Joseph* 11249. An undershrub; not common; flowers pinkish, densely crowded at the base of the main stem.

L. fasciculata (Retz.) Nees
Bori R. F., 550 m., 1-5-1961, *Joseph* 12482. A fairly common villous herb with flowers having white corolla with purple spots.

Nelsonia canescens (Lamk.) Spreng. (=*N. campestris* R. Br.)
Bori R. F., 550 m., 1-5-1961, *Joseph* 12483. A common diffuse herb with pinkish flowers.

Nilgirianthus heyneanus var. **neesii** Bremek. (=*Strobilanthes heyneanus* Nees)
Bori R. F., 900 m., 6-10-1960, *Joseph* 11264. A fairly common shrub with blue flowers.

Petalidium barlerioides (Roth) Nees
Bori R. F., 550 m., 28-4-1961, *Joseph* 12432. A common shrub; flower white, slightly scented.

Rungia repens (Linn.) Nees
Bunglapura, 300 m., 1-10-1960, *Joseph* 11171. Common; flowers bluish.

VERBENACEAE

Clerodendrum viscosum Vent. (=*C. infortunatum* auct. mult. non Linn.)
Kothiri (Bori R. F.), 550 m., 30-4-1961, *Joseph* 12479. A fairly common shrub with white scented flowers; corolla throat pinkish.

C. serratum (Linn.) Moon.
Bunglapura, 300 m., 1-10-1960, *Joseph* 11178. Common in shady places with bluish white flowers.

Gmelina arborea Roxb.
Bori R. F., 550 m., 30-4-1961, *Joseph* 12464. A small tree; not common; flowers yellow.

Lantana camara Linn. var. **aculeata** (Linn.) Moldenke (=*L. aculeata* Linn.)

Bori R. F., 550 m., 28-4-1961, *Joseph* 12437. Fairly common.

Vitex negundo Linn.

Bunglapura, 300 m., 30-9-1960, *Joseph* 11127. Fairly common shrub near streams; flowers bluish-purple.

LABIATAE

Acrocephalus indicus (Burm.) Ktz.

Towa river bank, 300 m., 30-9-1960, *Joseph* 11113. A common small herb, in damp places, with white flowers.

Anisochilus carnosus Wall.

Churna, 430 m., 3-10-1960, *Joseph* 11212. Common; flowers pink in long peduncled spikes.

A. eriocephalus Benth.

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11312. Common; flowers pinkish.

Anisomeles indica (Linn.) Ktz. (=*A. ovata* R. Br.)

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11042. A fairly common aromatic herb in waste lands; flowers pinkish white.

Colebrookea oppositifolia Sm.

Bori R. F., 550 m., 30-4-1961, *Joseph* 12462. A common shrub, in teak forests, with white flowers in panicles.

Lavandula bipinnata (Roth) Ktz.

Bori R. F., 900 m., 6-10-1960, *Joseph* 11269. An erect slender herb, not common, with pinnatisect leaves and blue flowers.

Leucas biflora R. Br.

Bunglapura, 300 m., 1-10-1960, *Joseph* 11160. A common slender, apparently climbing herb with white flowers.

L. cephalotes Spreng.

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11083. A common coarse stout herb in waste lands; flowers in large clusters.

L. mollissima Wall.

Bunglapura, 300 m., 30-9-1960, *Joseph* 11121. Common herb among bushes; flowers white.

L. montana Spreng. var. **hamiltoniana** (Wall.) Haines

Bori R. F., 550 m., 30-4-1961, *Joseph* 12472. Common; flowers white.

L. stricta Benth.

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11310. A small hispid herb, common, flowers white.

Micromeria biflora Benth.

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11325. A common prostrate, aromatic herb; flowers white.

Nepeta hindostana (Roth) Haines (=*N. ruderalis* Buch.-Ham.)

Bunglapura, 356 m., 22-4-1961, *Joseph* 12386. A fairly common slender herb; flowers white, scented, in unilateral dense cymes.

Plectranthus mollis (Ait.) Spreng. (=*P. incanus* Link)

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11318. Common succulent herb; flowers whitish.

Pogostemon plectranthoides Desf.

Bori R. F., 550 m., 30-4-1961, *Joseph* 12460. A common aromatic shrub; flowers white.

P. pubescens Benth.

Bori R. F., 550 m., 30-4-1961, *Joseph* 12463. Common in waste lands; flowers pinkish.

NYCTAGINACEAE

Boerhaavia diffusa Linn. (=*B. repens* Linn.)

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11071. A very common diffuse herb with deep pink flowers.

AMARANTHACEAE

Achyranthes aspera Linn. var. **argentea** Hk. f.

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11044. A common herb in waste open fields; leaves silverly silky beneath.

Aerva lanata (Linn.) A. Juss.

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11050. Common.

A. sanguinolenta (Linn.) Bl. (=*A. scandens* Wall.)

Dhain, 462 m., 4-10-1960, *Joseph* 11243. A common climbing undershrub among bushes.

Allmania nodiflora R. Br. var. **dichotoma** Hk. f.

Churna, 413 m., 27-7-1961, *Joseph* 12872. Fairly common erect herb, amidst grasses, with sessile globose spikes; flowers pinkish-white.

Alternanthera sessilis (Linn.) R. Br. (=*A. triandra* Lamk.)

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11081. A common prostrate herb, in moist grounds, with white flowers.

Amaranthus spinosus Linn.

Bunglapura, 356 m., 4-5-1961, *Joseph* 12489. A common spinous herb.

Celosia argentea Linn.

Bunglapura, 300 m., 30-9-1960, *Joseph* 11114. A very common annual among grasses; spikes with white basal florets and rosy-red terminal ones.

Digera muricata (Linn.) Mart. (=*D. arvensis* Forsk.)

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11085. A common slender herbaceous weed in waste lands; flowers pinkish.

Gomphrena celosioides Mart. (=*G. decumbens* auct. non Jacq.)

Round about Hoshangabad, 300 m., 29-9-1960, *Joseph* 11055. A common hirsute, procumbent herb among grasses; spikes with white flowers.

Pupalia lappacea (Linn.) A. Juss.
Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11064. Common; flowers creamy white, on elongated peduncles.

POLYGONACEAE

Polygonum barbatum Linn.
Towa river bank, 300 m., 30-9-1960, *Joseph* 11126. Common in moist places; flowers pinkish.

P. plebejum R. Br.
Towa river bank, 356 m., 22-4-1961, *Joseph* 12388. A fairly common deep rooted herb with pinkish stem and flowers.

P. punctatum Buch.-Ham.
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11337. A common weed with creamy white flowers.

LAURACEAE

Litsea glutinosa (Lour.) C.B. Robinson (=*L. chinensis* Lamk.; *L. sebifera* Pers.)
Dhain, 430 m., 28-7-1961, *Joseph* 12878. A fairly common tree with greenish-white flowers.

LORANTHACEAE

Dendrophthöe falcata (Linn.f.) Etting. (=*Loranthus longiflorus* Desr.)
Bunglapura, 356 m., 24-4-1961, *Joseph* 12415. Common stem-parasite.

Scurrula philippensis (Cham. & Schlecht.) G. Don (=*Loranthus buddleoides* Desr. in part)
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11308. Common with dull-brown flowers.

Viscum nepalense Spreng. (=*V. articulatum* Hk. f. non Burm.)
Bunglapura, 356 m., 22-4-1961, *Joseph* 12394. Leafless stem-parasite; common on deciduous trees.

EUPHORBIACEAE

Antidesma ghaesembilla Gaertn.
Kesla-Bunglapura, 356 m., 22-7-1961, *Joseph* 12825. A common small deciduous tree with greenish flowers.

A. menasu Miq. ex Tul.
Bunglapura, 356 m., 22-7-1961, *Joseph* 12827. A fairly common tree; flowers greenish in long slender racemes.

Baliospermum montanum (Willd.) Muell.-Arg. (=*B. axillare* Blume)
Bori R. F., 1000 m., 6-10-1960, *Joseph* 11301 and Bori R. F., 550 m., 28-4-1961, *Joseph* 12436. Common stout leafy undershrubs.

Bridelia squamosa Gehrm. (=*B. retusa* Hk.f. in part non Spreng.)
Bori area, 1000 m., 6-10-1960, *Joseph* 11303. A very common tree with greenish flowers.

Emblica officinalis Gaertn. (=*Phyllanthus emblica* Linn.)
Bunglapura, 356 m., 24-4-1961, *Joseph* 12412. A very common tree with small pinkish flowers.

Euphorbia antiquorum Linn.
Bori R. F., 550 m, 29-4-1961, *Joseph* 12445. Common in rocky localities.

E. geniculata Orteg.
Bunglapura, 300 m., 1-10-1960, *Joseph* 11170. Fairly common; flowers greenish.

E. hirta Linn.
Round about Hoshangabad, 300 m., 28-9-1960. *Joseph* 11075. A very common, prostrate, hispid weed.

E. parviflora Linn.(=*E. hypercifolia* Linn. in part)
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11074. Common; prostrate, hispid herb with small pinkish flowers.

E. pygnostegia Boiss. var. **zornioides** (Boiss.) Santapau (=*E. zornioides* Boiss.)
Bori R. F., 900 m., 6-10-1960, *Joseph* 11271. A fairly common slender erect herb with pinkish stem and greenish flowers.

Homonoia riparia Lour.
Bori R. F., 550 m., 29-4-1961, *Joseph* 12448. A common erect shrub with slender axillary spikes of greenish flowers.

Mallotus philippensis (Lamk.) Muell.-Arg.
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11319. Common.

Phyllanthus debilis Klein ex Willd.
Dhain, 462 m., 4-10-1960, *Joseph* 11240. A slender fairly common herb with greenish flowers.

P. maderaspatensis Linn.
Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11089. Common herb with yellow flowers.

Securinega leucopyrus (Willd.) Muell.-Arg. (=*Fluggea leucopyrus* Willd.)
Bori R. F., 550 m., 29-4-1961, *Joseph* 12447. A common thorny shrub, in open fields, with very small greenish flower buds.

S. virosa (Roxb. ex Willd.) Pax & Hoffm. (=*Fluggea virosa* Baill.)
Bunglapura, 600 m., 24-7-1961, *Joseph* 12863, 12868. A small common shrub with yellowish green small flowers in axillary clusters.

Tragia cannabina Linn. f.
Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11051. Common on grassy slopes with white stinging hairs.

ULMACEAE

Trema orientalis (Linn.) Bl.
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11331. Common tree; flowers greenish.

URTICACEAE

Boehmeria scabrella (Roxb.) Gaud. (=*B. platyphylla* Don var. *scabrella* Wedd.)
Bori R. F., 1000 m., 6-10-1960, *Joseph* 11297. A

shrub, not quite common; flowers creamy white in sessile clusters on long slender axillary spikes.

Girardinia zeylanica Dcne.

Dhain, 462 m., 4-10-1960, *Joseph* 11250. Common undershrub with stinging hairs.

MORACEAE

Ficus arnottiana Miq.

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11317. Common; syconia towards the apices of the leafy branches.

F. asperrima Roxb.

Bori R. F., 550 m., 29-4-1961, *Joseph* 12455. A very large tree with prop roots and axillary reddish syconia.

F. gibbosa Bl. var. **parasitica** (Koen.) King

Bori R. F., 550 m., 29-4-1961, *Joseph* 12451. A semi-epiphytic tree; syconia small, restricted to the leafy branches.

F. glomerata Roxb.

Towa river bank, 300 m., 1-10-1960, *Joseph* 11185. A common tree along river sides; syconia from the main stem.

F. hispida Linn. f.

Bori R. F., 500 m., 29-4-1961, *Joseph* 12452. A fairly common tree without aerial root; syconia on long pendulous peduncles.

F. lacor Buch.-Ham. (=*F. infectoria* Roxb.)

Bori R. F., 550 m., 29-4-1961, *Joseph* 12440. A large deciduous common tree; syconia in the axils of the fallen leaves on the branches.

F. lacor Buch.-Ham. var. **lambertiana** (Miq.) Santapau (=*F. infectoria* Roxb. var. *lambertiana* King)

Bori R. F., 1000 m., 6-10-1960, *Joseph* 11295. Tree, not common with syconia in peduncles.

F. microcarpa Linn. f.

Bori R. F., 550 m., 29-4-1961, *Joseph* 12444. Common tree; syconia small, axillary.

F. religiosa Linn.

Bori R. F., 550 m., 30-4-1961, *Joseph* 12466. Not common.

ORCHIDACEAE

Aerides odoratum Lour.

Bunglapura, 500 m., 23-7-1961, *Joseph* 12837. A common epiphyte with many rosy-red flowers in long pendulous racemes.

Habenaria gibsonii var. **foetida** Blatt. & McC.

Kesla-Bunglapura, 356 m., 22-7-1961, *Joseph* 12830. A common terrestrial erect tuberous herb with foul smelling greenish flowers in terminal racemes.

Peristylus lawii Wt.

Kesla-Bunglapura, 500 m., 23-7-1961, *Joseph* 12848. A very common terrestrial orchid, in shady places, 10-15 cm. tall, tuberous; flowers small, white, lax flowered.

Vanda tessellata Hk. f.

Bunglapura, 356 m., 24-4-1961, *Joseph* 12421. Very common epiphyte with large flowers in erect racemes; perianth dull brown with wavy margin.

ZINGIBERACEAE

Costus speciosus (Koen.) Sm.

Churna, 430 m., 2-10-1960, *Joseph* 11202. A common tall herb in moist shady places; inflorescence terminal; fruits oblong with bright-red bracts.

Curcuma amada Roxb.

Kesla-Bunglapura, 356 m., 22-7-1961, *Joseph* 12822. A very common herb in shady places with beautiful erect mauve coloured long spikes from the centre of a tuft of leaves.

Hedychium coronarium Koen.

Churna, 430 m., 2-10-1960, *Joseph* 11200. A fairly common tall herb with elongated terminal, strobiliform dense spikes; flowers white with red bracts.

Zingiber roseum Rosc.

Bori R. F., 900 m., 6-10-1960, *Joseph* 11286. A common tall erect herb in the same habitat as that of the above species; inflorescence dense; bracts blood-red.

AMARYLLIDACEAE

Crinum defixum Ker.

Towa river bank, 300 m., 1-10-1960, *Joseph* 11186. A fairly common stout herb, in the rocky crevices near the river side, with broad radical leaves and white scented flowers on long erect scapes.

TACCACEAE

Tacca leontopetaloides (Linn.) Ktz. (=*T. pinnatifida* Forst.)

Kesla-Bunglapura, 356 m., 22-7-1961, *Joseph* 12818. A very common herb soon after the rains, with globular corm; flowers in umbels on long scapes, with spathaceous bracts and filiform brown bracteoles; perianth greenish with purple rim.

DIOSCOREACEAE

Dioscorea anguina Roxb.

Dhain, 462 m., 4-10-1960, *Joseph* 11236. Fairly common; leaves simple, broadly ovate.

D. bulbifera Linn. (=*D. sativa Thunb.* non Linn.)

Churna, 413 m., 27-7-1961, *Joseph* 12876. A fairly common climber on bushes, with warted bulbils in the axils of leaves.

D. hispida Dennst. (=*D. daemona* Roxb.)

Bunglapura, 600 m., 24-7-1961, *Joseph* 12860. A common twiner with trifoliate leaves.

D. pentaphylla Linn.

Bori R. F., 1000 m., 6-10-1960, *Joseph* 11305. A common climber with often five foliolate leaves; capsules winged.

LILIACEAE

Chlorophytum laxum R. Br.

Kesla-Bunglapura, 500 m., 23-7-1961, *Joseph* 12850. A fairly common herb with grass-like leaves.

Chlorophytum tuberosum (Roxb.) Baker
Churna, 413 m., 27-7-1961, *Joseph* 12871. A common herb, among grasses, with white small flowers.

Gloriosa superba Linn.
Churna, 430 m., 2-10-1960, *Joseph* 11196. Very common climber; flowers with petaloid perianth having wavy margin.

Scilla indica Baker
Kesla-Bunglapura, 356 m., 22-7-1961, *Joseph* 12824. A common small bulbous herb in open fields soon after the rains; leaves with dark green patches above the lamina.

Urginea coromandeliana Hk. f.
Bori R. F., 550 m., 29-4-1961, *Joseph* 12439. Common bulbous herb, leafless when flowering; flowers creamy white, in long slender racemes.

SMILACACEAE

Smilax zeylanica Linn.
Bunglapura, 500 m., 23-7-1961, *Joseph* 12851. Common tendril climber with flowers in umbels.

COMMELINACEAE

Commelina benghalensis Linn.
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11088. Very common herb with ovate leaves and bluish-white flowers.

C. hasskarlii C.B. Cl.
Churna, 430 m., 2-10-1960, *Joseph* 11199. Common in moist places with deep pinkish stem and light violet flowers.

C. kurzii C.B. Cl.
Bunglapura, 600 m., 24-7-1961, *Joseph* 12865. Very common herb with lanceolate leaves and bluish flowers.

C. suffruticosa Bl.
Dhain-Bori area, 462 m., 4-10-1960, *Joseph* 11226. Fairly common slender herb with creamy-white flowers.

Cyanotis cristata (Linn.) D. Don
Bunglapura, 300 m., 1-10-1960, *Joseph* 11149. Fairly common; creeping herb with biseriate foliaceous bracteoles having bluish flowers.

C. cucullata Kunth
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11082. A common small herb with whitish blue flowers inside the leaf sheaths.

Murdannia malabaricum (Linn.) Santapau [=*M. nudiflorum* (Linn.) Brenan; *Aneilema nudiflorum* R. Br.]
Towa river bank, 300 m., 30-9-1960, *Joseph* 11119. A common decumbent herb, on moist soil, with bluish-white flowers.

M. spiratum (Linn.) Brückner (=*Aneilema spiratum* R. Br.)
Churna, 430 m., 2-10-1960, *Joseph* 11195. A fairly common decumbent herb with bluish-pink flowers.

PALMACEAE

Phoenix humilis Royle
Bori R. F., 550 m., 30-4-1961, *Joseph* 12457. Fairly common, low shrub; spadix yellowish.

ARACEAE

Remusatia vivipara (Roxb.) Schott
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11320. Fairly common with leafless bulbiferous shoots from the sides of tubers.

Theriophonum wightii Schott
Kesla-Bunglapura, 356 m., 22-7-1961, *Joseph* 12826. A common tuberous herb with hastately three lobed leaves; spathe greenish.

NAJADACEAE

Najas graminea Del.
Bunglapura, 356 m., 28-7-1961, *Joseph* 12886. A common hydrophyte with narrow leaves and minute axillary flowers.

ERIOCAULACEAE

Eriocaulon cinereum R. Br. (=*E. sieboldianum* Sieb. & Zucc.)
Towa river bank, 300 m., 1-10-1960, *Joseph* 11147. Common herb with short narrow radical leaves and ashy white heads.

E. quinquangulare Linn.
Bori R. F., 900 m., 6-10-1960, *Joseph* 11276. Common herb in wet localities with narrow ensiform radical leaves.

CYPERACEAE

Cyperus compactus Retz. (=*Mariscus compactus* Druce)
Churna, 430 m., 2-10-1960, *Joseph* 11215. Common perennial herb with compound umbles; spikelets compressed with brownish glumes.

C. compressus Linn.
Towa river bank, 300 m., 30-9-1960, *Joseph* 11112. Common, in moist situations with distinctly compressed spikelets.

C. difformis Linn.
Towa river bank, 300 m., 30-9-1960, *Joseph* 11107. Common in marshy localities; glumes light yellow.

C. iria Linn.
Towa river bank, 300 m., 30-9-1960, *Joseph* 11105. Quite common herb among grasses, in wet soil; flowers in compound umbels.

C. leucocephalus Retz.
Bunglapura, 500 m., 23-7-1961, *Joseph* 12847. Fairly common.

C. niveus Retz.
Bunglapura, 600 m., 24-7-1961, *Joseph* 12862. Fairly common herb in dry fields with compressed spikelets.

Cyperus pangorei Rottb.
Towa river bank, 300 m., 1-10-1960, *Joseph* 11183. A common tall herb with much branched inflorescence.

C. pumilus Linn. (=*Pycreus pumilus* Don)
Bunglapura, 300 m., 30-9-1960, *Joseph* 11098. Fairly common small herb in the sites of shady places.

C. rotundus Linn.
Towa river bank, 300 m., 30-9-1960, *Joseph* 11103. A common weed.

Fimbristylis littoralis Gandich (='*F. miliacea* Vahl': C. B. Clarke)
Towa river bank, 300 m., 30-9-1960, *Joseph* 11095. A tufted erect herb in moist localities.

Scirpus squarrosus Linn.
Towa river bank, 300 m., 30-9-1960, *Joseph* 11107. Common in moist localities.

Scleria hebecarpa Nees
Towa river bank, 300 m., 1-10-1960, *Joseph* 11173. Common erect herb with white puberulous nuts in the axils of capillary bracteoles.

GRAMINEAE

Apluda mutica Linn. [=*A. mutica* var. *aristata* (Linn.) Pilger]
Bunglapura, 300 m., 1-10-1960, *Joseph* 11156. A very common gregarious grass all along the way-sides of the forest.

Aristida depressa Retz.
Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11047. A common slender tufted grass, in waste lands, with dull green spikelets.

Arthraxon quartinianus (A. Rich.) Nash
Towa river bank, 300 m., 30-9-1960, *Joseph* 11100. A common grass, often found in swampy places, with light green to brownish-violet glumes.

Arundinella pumila (Hochst.) Steud.
Bunglapura, 300 m., 1-10-1960, *Joseph* 11146. A tiny grass, common in shady places.

Bothriochloa glabra (Roxb.) A. Camus [=*Amphilophis glabra* (Roxb.) Stapf]
Churna, 430 m., 3-10-1960, *Joseph* 12216. A common fodder grass with pinkish glumes.

Chionachne koenigii (Spreng.) Thw. (=*Coix koenigii* Spreng.)
Bunglapura, 300 m., 1-10-1960, *Joseph* 11155. A tall grass in wet places; not very common.

Chloris dolichostachya Lagasca (=*C. incompleta* Roth)
Bori R. F., 900 m., 6-10-1960, *Joseph* 11280. A very common grass often in shady places.

C. virgata Sw.
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11046. A quite common, good fodder grass.

Chrysopogon polyphyllus (Hack.) Blatter & McCann (=*Andropogon polyphyllus* Hack. ex Hk. f.)
Towa river bank, 300 m., 30-9-1960, *Joseph* 11124. A fairly common grass, near water sources, with yellowish-green glumes.

Coix gigantea Koenig ex Roxb.
Churna, 430 m., 3-10-1960, *Joseph* 11214. Common near river sides.

Cymbopogon martinii (Roxb.) Wats. (=*Andropogon martinii* Roxb.)
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11307. A common broad-leaved grass.

Cyrtococcum oxyphyllum (Steud.) Stapf (=*Panicum oxyphyllum* Steud.)
Bori R. F., 900 m., 6-10-1960, *Joseph* 11278. A common grass in damp shady places of the forest.

Dendrocalamus strictus Nees
Churna, 413 m., 26-4-1961, *Joseph* 12428. Fairly common.

Desmostachya bipinnata (Linn.) Stapf [=*Eragrostis cynosuroides* (Retz.) P. Beauv.]
Kesla-Bunglapura, 500 m., 23-7-1961, *Joseph* 12855. A tufted grass, in dry areas, with chocolate-brown glumes; an excellent soil binder.

Dichanthium annulatum (Forsk.) Stapf (=*Andropogon annulatus* Forsk.)
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11068. Common; excellent fodder grass.

Diectomis fastigiata (Sw.) Kunth (=*Andropogon fastigiatus* Sw.)
Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11334. A very common grass in open fields.

Digitaria adscendens (H.B.K.) Henr. (=*D. marginata* Link)
Bori area, 1000 m., 6-10-1960, *Joseph* 11292. A very common fodder grass often found near water sources.

Eleusine indica (Linn.) Gaertn.
Dhain, 462 m., 4-10-1960, *Joseph* 11246. A short grass, in rocky habitat, with two or more digitate racemes.

Eragrostis nutans (Retz.) Nees ex Steud.
Bori area, 1000 m., 6-10-1960, *Joseph* 11298. A common perennial grass.

E. tenella (Linn.) P. Beauv. [=*E. plumosa* (Retz.) Link]
Bori area, 1000 m., 6-10-1960, *Joseph* 11302. A common grass with long plumose inflorescence.

E. unioloides (Retz.) Nees ex Steud.
Hoshangabad, 300 m., 28-9-1960, *Joseph* 11062. A very common grass, on waste lands, with pinkish spikelets.

Eragrostiella brachyphylla (Stapf) Bor (=*Eragrostis brachyphylla* Stapf)
Kesla-Bunglapura, 500 m., 23-7-1961, *Joseph* 12846. Common in dry open areas.

Hackelochloa granularis (Linn.) Ktz. (=*Manisuris granularis* Linn. f.)

Bunglapura, 300 m., 1-10-1960, *Joseph* 11172. A common grass on the waysides in forests.

Heteropogon contortus (Linn.) P. Beauv. ex R. & S. (=*Andropogon contortus* Linn.)

Hoshangabad, 300 m., 28-9-1960, *Joseph* 11052. A common fodder grass, in varied habitats, with hygroscopic awns.

Isachaemum indicum (Houtt) Merrill (=*I. ciliare* Retz.)

Towa river side, Bunglapura, 300 m., 30-9-1960, *Joseph* 11111. A very common grass with greenish glumes.

Iseilema laxum Hack.

Hoshangabad, 300 m., 28-9-1960, *Joseph* 11054. Very common.

Manisuris forficulata C.E.C. Fischer (=*Rottboellia divergens* Lisboa non Hack.)

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11336. Common in open fields.

M. myurus Linn. [=*Rottboellia myurus* (Linn.) Benth.]

Bunglapura, 300 m., 30-9-1960, *Joseph* 11125. A very common grass.

Melanocenchris jacquemontii Taub. et Spach (=*M. royleana* Nees)

Hoshangabad, 300 m., 28-9-1960, *Joseph* 11067. A small tufted grass, common on rocky places, awns purple.

Microstegium petiolare (Trin.) Bor [=*Ischaemum petiolare* (Trin.) Hack.]

Bunglapura, 300 m., 1-10-1960, *Joseph* 11154. Common grass on the way sides.

Oplismenus burmanii (Retz.) P. Beauv. (=*Panicum burmanii* Retz.)

Bunglapura, 300 m., 30-9-1960, *Joseph* 11109. A common slender procumbent grass, in shady places, with light green glumes and long whitish awns.

O. compositus (Linn.) P. Beauv. (=*Panicum compositum* Linn.)

Bori R. F., 900 m., 6-10-1960, *Joseph* 11273. A common gregarious grass with long sticky awns.

Oryza sativa Linn.

Hoshangabad, 300 m., 28-9-1960, *Joseph* 11058. An escape from cultivated fields.

Panicum miliare Lamk.

Bori R. F., 1000 m., 6-10-1960, *Joseph* 11287. A common, good fodder grass.

Paspalidium flavidum (Retz.) A. Camus (=*Panicum flavidum* Retz.)

Towa river bank, 300 m., 1-10-1960, *Joseph* 11175. A common grass, in moist places, with spikes shorter than the internodes.

P. scrobiculatum Linn.

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph*. 11335. A common semi-erect tufted grass with brown glumes.

Pennisetum pedicellatum Trin.

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11063. A fairly common grass with beautiful terminal long purple spikes.

Perotis indica (Linn.) Ktz.

Bunglapura, 300 m., 1-10-1960, *Joseph* 11180. A common small erect grass with long thick spikes; awns violet.

Rottboellia exaltata Linn. f.

Churna, 430 m., 3-10-1960, *Joseph* 11209. A common tall grass.

Saccharum spontaneum Linn.

Bori R. F., 900 m., 6-10-1960, *Joseph* 11279. Quite common grass in open grounds; spikes with silky white hairs; glumes pinkish.

Setaria homonyma (Steud.) Choiv. (=*Panicum homonyma* Steud.)

Around Pachmarhi, 1000 m., 8-10-1960, *Joseph* 11333. A slender tall grass; not common.

S. italica (Linn.) P. Beauv. (=*Panicum italicum* Linn.)

Bori R. F., 1000 m., 6-10-1960, *Joseph* 11289. Fairly common grass with thick long spikes.

Sorghum halepense (Linn.) Pers.

Bunglapura, 300 m., 1-10-1960, *Joseph* 11182. A common tall grass often by the side of rivers.

S. nitidum (Vahl) Pers.

Churna, 430 m., 30-10-1960, *Joseph* 11280. A common tall grass along the wayside.

Spodiopogon rhizophorus (Steud.) Pilger [=*S. albidus* (Wall.) Benth.]

Bori area, 1000 m., 6-10-1960, *Joseph* 11294. A gregarious leafy grass; spikes densely hairy, glumes pinkish yellow.

Themeda quadrivalvis (Linn.) Ktz. (=*Anthistiria ciliata* Linn. f.)

Round about Hoshangabad, 300 m., 28-9-1960, *Joseph* 11053. A very common fodder grass.

Tripogon bromoides R. & S. (=*Trianthera bromoides* Roth ex R. & S.)

Bori R. F., 900 m., 6-10-1960, *Joseph* 11254. A slender grass, not very common, with small spikes on either side of the main long peduncle.

Vetiveria zizanioides (Linn.) Nash

Bunglapura, 300 m., 1-10-1960, *Joseph* 11184. A tall grass, often common on rich soil.

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